UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,080	01/12/2005	Magnus Astrom	P04,0495	6617

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EXAMINER
GEDEON, BRIAN T

ART UNIT	PAPER NUMBER
3766	

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/521,080	ASTROM ET AL.
	Examiner	Art Unit	
	Brian T. Gedeon	3766	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☒ Claim(s) *5-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date. *8/15/2005*.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claims 5-13 are objected to under 37 CFR 1.75(c) as being in improper form

because a multiple dependent claim may not depend from another multiple dependent

claim. Further, the language "...according to any of the preceding claims..." renders the

dependency of these claims unclear, See MPEP § 608.01(n). Accordingly, since the

claims contain improper multiple dependents, the objected to claims have not been

further treated on the merits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley et

al. (US Patent no. 5,271,411).

In regard to claim 1, Ripley et al. describe a method and apparatus for ECG

signal analysis and arrhythmia detection in which the QRS complex is identified, and

features of the complex are extracted and compared to features in a list of clusters that

exist in RAM 30, col 8 lines 37-67. Clusters are made upon when new features not

previously detected appear. If there are clusters in the cluster list, then the distance

between the QRS complex's features and each clusters position in the feature space

are found; furthermore the distance between clusters in measured, and compared to a

predetermined distance in order to make a determination if the features clusters are

appropriately different than the other clusters or if they are too similar in which case the

clusters would then be merged, col 9 lines 48-58. The Examiner interprets this to mean

that a feature vector, i.e., the position in space and distance between clusters, is

calculated, and is compared to a threshold, i.e., the predetermined distance, in order to

help assign features to specific clusters, i.e., whether or not the features of a cluster

should be merged or left as a separate cluster. Since Ripley et al. perform the function

of the claimed invention; it must necessarily be true that Ripley et al. have structure to

serve as the means for performing the said functions. With regard to wavelets, it has

become increasingly well known in the art that wavelet transforms are useful for

analyzing signals pertaining to heart rate and ECG signals. Therefore it would have

been obvious to one of ordinary skill in the art at the time the invention was made to use

feature extraction as a technique for quantifying QRS complex or other ECG related

signals since it is known that it is a useful technique for grouping heart beats into similar

classes, as well as judging whether a given beat is normal or abnormal, col 1 lines 17-

27.

3.   Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ripley et al. (US Patent no. 5,271,411) in view of Li et al. (US PG-Pub 2004/0096100).

        In regard to claim 2, Ripley et al. substantially describe the invention as claimed

except for the calculation of a covariance matrix to define the respective cluster

features. Li et al. describe a method and computer program product for identifying

classes of feature space which uses feature extraction, clustering, and feature vector calculations, [0002], [0008], and [0031]. A covariance matrix is calculated as part of the classification process, [0035]. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a covariance matrix since Li et al. teach that it is a necessary calculation for classifying features in clusters of a feature extraction technique.

In regard to claims 3 and 4, Ripley et al. substantially describe the invention as claimed, including the calculation of distances between clusters. However, Ripley et al. fail to teach the formula for calculating the distance. Li et al. teach that the Mahalanobis distance criterion is a known formula for aiding in the classification of clusters based on distance calculations, [0050], therefore it would have been obvious to one of ordinary skill in the art. Further, since Li et al. calculate a matrix, it would also be obvious to calculate distance measurements by a grid search.

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Duong-Van (US Patent no. 5,439,483) discloses a method for quantifying cardiac fibrillation using a wavelet transform.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Gedeon whose telephone number is (571) 272 3447. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert E. Pezzuto can be reached on (571) 272 6996. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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BTG